

WHAT IS CLAIMED IS:

1           1.     A network system, comprising:

2                 a server system having a server input/output processor to monitor the server  
3                 system and to issue a server down message when the server system is down;

4                 a storage array having a storage array input/output processor to monitor the  
5                 storage array and to issue a storage array down message when the storage array is down;  
6                 and

7                 a storage router interconnecting the server system and the storage array, the  
8                 storage router having a storage router input/output processor to monitor the storage router  
9                 and to issue a storage router down message when the storage router is down, wherein the  
10                 server system and the storage array each have a cluster management information base  
11                 (MIB).

1           2.     The system according to claim 1, wherein data transmitted to and from the server  
2                 system and the server down message travel along a connection between the server system and  
3                 the storage router.

1           3.     The system according to claim 1, wherein data transmitted to and from the storage  
2                 array and the storage array down message travel along a connection between the storage array  
3                 and the storage router.

1           4.     The system according to claim 1, wherein the server system and the storage router  
2                 are members of a network cluster.

1           5.       The system according to claim 1, wherein the server system is connected to the  
2 storage router via a Gig-Ethernet Internet Small Computer System Interface (iSCSI) connection.

1           6.       The system according to claim 1, wherein the storage array is connected to the  
2 storage router via a Gig-Ethernet Internet Small Computer System Interface (iSCSI) connection.

1           7.       The system according to claim 1, wherein the storage router further includes a  
2 second storage router input/output processor, the storage router input/output processor being in  
3 communication with the server input/output processor, and the second router input/output  
4 processor being in communication with the storage array input/output processor.

1           8.       The system according to claim 1, wherein the server input/output processor and  
2 the storage array input/output processor run on a real-time operating system (RTOS).

1           9.       An input/output processor for a system within a network cluster, comprising:  
2                   a health monitoring and heartbeat logic circuit to monitor the system and to  
3 generate a system down message when the system is down;  
4                   a failure/recovery logic circuit to designate a status of the system and to allow the  
5 system to take over for a failed system;  
6                   a cluster node add/remove logic circuit to allow addition or removal of  
7 systems without taking the network cluster offline; and  
8                   a cluster membership discovery/reconcile logic circuit to establish the network  
9 cluster and to ensure cluster failover support for the systems within the network cluster.

1           10.    The input/output processor according to claim 9, wherein the system is a server  
2 system.

1           11.    The input/output processor according to claim 9, wherein the system is a storage  
2 array.

1           12.    The input/output processor according to claim 9, wherein the system is a storage  
2 router.

1           13.    The input/output processor according to claim 9, wherein data and the system  
2 down message transmitted to and from the input/output processor travel along a connection  
3 between the input/output processor and a second input/output processor of a second system.

1           14.    The input/output processor according to claim 9, wherein the status is selected  
2 from the group consisting of active, failed, recovered, and standby.

1           15.    The input/output processor according to claim 9, wherein the input/output  
2 processor runs on a real-time operating system (RTOS).

1           16.    The input/output processor according to claim 9, wherein the system includes a  
2 cluster management information base (MIB) that is accessible to the input/output processor.

1 17. A network cluster, comprising:

2 a first server system having a first server input/output processor to monitor the  
3 first server system and to issue a first server down message when the first server system  
4 is down;

5 a first storage array having a first storage array input/output processor to monitor  
6 the first storage array and to issue a first storage array down message when the first  
7 storage array is down;

8 a second server system having a second server input/output processor to monitor  
9 the second server system and to issue a second server down message when the second  
10 server system is down;

11 a second storage array having a second storage array input/output processor to  
12 monitor the second storage array and to issue a second storage array down message when  
13 the second storage array is down; and

14 a storage router interconnecting the first server system, the second server system,  
15 the first storage array, and the second storage array, the storage router having a storage  
16 router input/output processor to monitor the storage router and to issue a storage router  
17 down message when the storage router is down, wherein the first server system, the  
18 second server system, the first storage array, and the second storage array each have  
19 a cluster management information base (MIB).

1 18. The network cluster according to claim 17, wherein data transmitted to and from  
2 the first server system and the first server down message travel along a connection between the  
3 first server system and the storage router.

1           19.    The network cluster according to claim 17, wherein data transmitted to and from  
2 the first storage array and the first storage array down message travel along a connection  
3 between the first storage array and the storage router.

1           20.    The network cluster according to claim 17, wherein data transmitted to and from  
2 the second server system and the second server down message travel along a connection between  
3 the second server system and the storage router.

1           21.    The network cluster according to claim 17, wherein data transmitted to and from  
2 the second storage array and the second storage array down message travel along a connection  
3 between the second storage array and the storage router.

1           22.    The network cluster according to claim 17, wherein the first server system, the  
2 first storage array, the second server system, and the second storage array are members of the  
3 network cluster.

1           23.    The network cluster according to claim 17, wherein the first server system is  
2 connected to the storage router via a Gig-Ethernet Internet Small Computer System Interface  
3 (iSCSI) connection.

1           24.    The network cluster according to claim 17, wherein the second server system is  
2 connected to the storage router via a Gig-Ethernet Internet Small Computer System Interface  
3 (iSCSI) connection.

1           25.    The network cluster according to claim 17, wherein the first storage array is  
2 connected to the storage router via a Gig-Ethernet Internet Small Computer System Interface  
3 (iSCSI) connection.

1           26.    The network cluster according to claim 17, wherein the second storage array is  
2 connected to the storage router via a Gig-Ethernet Internet Small Computer System Interface  
3 (iSCSI) connection.

1           27.    The system according to claim 17, wherein the storage router further includes a  
2 second storage router input/output processor, the storage router input/output processor being in  
3 communication with the first server input/output processor and the second server input/output  
4 processor, and the second router input/output processor being in communication with the first  
5 storage array input/output processor and the second storage array input/output processor.

1           28.    The system according to claim 17, wherein the first server input/output processor,  
2 the second server input/output processor, the first storage array input/output processor, and the  
3 second storage array input/output processor run on a real-time operating system (RTOS).